

1

SEQUENCE LISTING

<110> Wallach, David
Ramakrishnan, Parameswaran
Shmushkovich, Taisia
Wang, Wangxia

<120> METHODS OF REGULATING AN IMMUNE RESPONSE

<130> 27083

<160> 15

<170> PatentIn version 3.2

<210> 1

<211> 2844

<212> DNA

<213> Homo sapiens

<400> 1

```
atggcagtga tggaaatggc ctgcccaggt gccctggct cagcagtggg gcagcagaag    60
gaactcccca agccaaagga gaagacgccg cactgggga agaaacagag ctccgtctac    120
aagcttgagg ccgtggagaa gagccctgtg ttctgcgaa agtgggagat cctgaatgac    180
gtgattacca agggcacagc caaggaaggc tccgaggcag ggccagctgc catctctatc    240
atcgcccagg ctgagtgtga gaatagccaa gatttcagcc ccaccttttc agaacgcatt    300
ttcatcgctg ggtccaaaca gtacagccag tccgagagtc ttgatcagat cccaacaat    360
gtggcccatg ctacagaggg caaatggcc cgtgtgtgtt ggaaggaaa gcgtcgagc    420
aaagcccgga agaaacggaa gaagaagagc tcaaagtccc tggctcatgc aggagtggcc    480
ttggccaaac ccctccccag gaccctgag caggagagct gcaccatccc agtgcaggag    540
gatgagtctc cactcgccgc ccatatgtt agaaacaccc cgcagttcac caagcctctg    600
aaggaaccag gccttgggca actctgtttt aagcagcttg gcgagggcct acggccggct    660
ctgcctcgat cagaactcca caaactgatc agccccttgc aatgtctgaa ccacgtgtgg    720
aaactgcacc acccccagga cggaggcccc ctgcccctgc ccacgcaccc cttcccctat    780
agcagactgc ctcatccctt ccatccac cctctccagc cctggaaacc tcaccctctg    840
gagtccttcc tgggcaaact ggcctgtgta gacagccaga aacccttggc tgaccacac    900
ctgagcaaac tggcctgtgt agacagtcca aagccctgc ctggccaca cctggagccc    960
agctgcctgt ctctgtgtgc ccatgagaag tttctgtgag aggaatacct agtgcattgt    1020
ctgcaaggca gcgtgagctc aagccaggcc cacagcctga ccagcctggc caagacctgg    1080
gcagcacggg gctccagatc ccgggagccc agccccaaa ctgaggacaa cgagggtgtc    1140
ctgctcactg agaaactcaa gccagtggat tatgagtacc gagaagaagt cactgggcc    1200
acgcaccagc tccgcctggg cagaggctcc ttcggagagg tgcacaggat ggaggacaag    1260
cagactggct tccagtgcgc tgtcaaaaag gtgcggctgg aagtatttcg ggcagaggag    1320
ctgatggcat gtgcaggatt gacctaccc agaattgtcc cttgtatgg agctgtgaga    1380
gaagggcctt ggtcaacat cttcatggag ctgctggaag gtggctccct gggccagctg    1440
gtcaaggagc agggctgtct ccagaggac cgggcccctgt actacctggg ccaggccctg    1500
gagggctctg aatacctcca ctcacgaagg attctgcatg gggacgtcaa agctgacaac    1560
gtgctcctgt ccagcgatgg gagccacgca gccctctgtg actttggcca tgctgtgtgt    1620
```

2

ctccaacctg atggcctggg aaagtccttg ctcacagggg actacatccc tggcacagag 1680
 acccacatgg ctccggaggt ggtgctgggc aggagctgcg acgccaaggt ggatgtctgg 1740
 agcagctgct gtatgatgct gcacatgctc aacggctgcc acccctggac tcagttcttc 1800
 cgagggccgc tctgcctcaa gattgccagc gagcctccgc ctgtgaggga gatcccaccc 1860
 tcctgcgccc ctctcacagc ccaggccatc caagaggggc tgaggaaaga gcccatccac 1920
 cgcggtgtctg cagcggagct gggaggggag gtgaaccggg cactacagca agtgggaggt 1980
 ctgaagagcc cttggagggg agaataataa gaaccaagac atccaccgcc aaatcaagcc 2040
 aattaccacc agaccctcca tgcccagccg agagagcttt cgccaagggc cccagggccc 2100
 cggccagctg aggagacaac aggcagagcc cctaagctcc agcctcctct cccaccagag 2160
 cccccagagc caaacaagtc tcctcccttg actttgagca aggaggagtc tgggatgtgg 2220
 gaacccttac ctctgtcctc cctggagcca gccctgcc gaaaccccag ctcaccagag 2280
 cggaagcaa ccgtcccggg gcaggaactg cagcagctgg aaatagaatt attcctcaac 2340
 agcctgtccc agccattttc tctggaggag caggagcaaa ttctctcgtg cctcagcatc 2400
 gacagcctct ccctgtcggg tgacagtggg aagaacccat caaaggcctc tcaaagctcg 2460
 cgggacaccc tgagctcagg cgtacactcc tggagcagcc aggccgaggc tcgaagctcc 2520
 agctggaaca tgggtctggc ccgggggagg cccaccgaca cccaagcta tttcaatggt 2580
 gtgaaagtcc aaatacagtc tcttaatggt gaacacctgc acatccggga gttccaccgg 2640
 gtcaaagtgg gagacatcgc cactggcatc agcagccaga tcccagctgc agccttcagc 2700
 ttggtcacca aagacgggca gcctgttcgc tacgacatgg aggtgccaga ctcgggcatc 2760
 gacctgcagt gcacactggc ccctgatggc agcttcgcct ggagctggag ggtcaagcat 2820
 ggccagctgg agaacaggcc ctaa 2844

<210> 2
 <211> 947
 <212> PRT
 <213> Homo sapiens

<400> 2

Met Ala Val Met Glu Met Ala Cys Pro Gly Ala Pro Gly Ser Ala Val
1 5 10 15

Gly Gln Gln Lys Glu Leu Pro Lys Pro Lys Glu Lys Thr Pro Pro Leu
20 25 30

Gly Lys Lys Gln Ser Ser Val Tyr Lys Leu Glu Ala Val Glu Lys Ser
35 40 45

Pro Val Phe Cys Gly Lys Trp Glu Ile Leu Asn Asp Val Ile Thr Lys
50 55 60

Gly Thr Ala Lys Glu Gly Ser Glu Ala Gly Pro Ala Ala Ile Ser Ile
65 70 75 80

Ile Ala Gln Ala Glu Cys Glu Asn Ser Gln Glu Phe Ser Pro Thr Phe
85 90 95

Ser Glu Arg Ile Phe Ile Ala Gly Ser Lys Gln Tyr Ser Gln Ser Glu

3

100 105 110
 Ser Leu Asp Gln Ile Pro Asn Asn Val Ala His Ala Thr Glu Gly Lys
 115 120 125
 Met Ala Arg Val Cys Trp Lys Gly Lys Arg Arg Ser Lys Ala Arg Lys
 130 135 140
 Lys Arg Lys Lys Lys Ser Ser Lys Ser Leu Ala His Ala Gly Val Ala
 145 150 155 160
 Leu Ala Lys Pro Leu Pro Arg Thr Pro Glu Gln Glu Ser Cys Thr Ile
 165 170 175
 Pro Val Gln Glu Asp Glu Ser Pro Leu Gly Ala Pro Tyr Val Arg Asn
 180 185 190
 Thr Pro Gln Phe Thr Lys Pro Leu Lys Glu Pro Gly Leu Gly Gln Leu
 195 200 205
 Cys Phe Lys Gln Leu Gly Glu Gly Leu Arg Pro Ala Leu Pro Arg Ser
 210 215 220
 Glu Leu His Lys Leu Ile Ser Pro Leu Gln Cys Leu Asn His Val Trp
 225 230 235 240
 Lys Leu His His Pro Gln Asp Gly Gly Pro Leu Pro Leu Pro Thr His
 245 250 255
 Pro Phe Pro Tyr Ser Arg Leu Pro His Pro Phe Pro Phe His Pro Leu
 260 265 270
 Gln Pro Trp Lys Pro His Pro Leu Glu Ser Phe Leu Gly Lys Leu Ala
 275 280 285
 Cys Val Asp Ser Gln Lys Pro Leu Pro Asp Pro His Leu Ser Lys Leu
 290 295 300
 Ala Cys Val Asp Ser Pro Lys Pro Leu Pro Gly Pro His Leu Glu Pro
 305 310 315 320
 Ser Cys Leu Ser Arg Gly Ala His Glu Lys Phe Ser Val Glu Glu Tyr
 325 330 335
 Leu Val His Ala Leu Gln Gly Ser Val Ser Ser Ser Gln Ala His Ser
 340 345 350
 Leu Thr Ser Leu Ala Lys Thr Trp Ala Ala Arg Gly Ser Arg Ser Arg
 355 360 365
 Glu Pro Ser Pro Lys Thr Glu Asp Asn Glu Gly Val Leu Leu Thr Glu
 370 375 380
 Lys Leu Lys Pro Val Asp Tyr Glu Tyr Arg Glu Glu Val His Trp Ala
 385 390 395 400

4

Thr His Gln Leu Arg Leu Gly Arg Gly Ser Phe Gly Glu Val His Arg
405 410 415

Met Glu Asp Lys Gln Thr Gly Phe Gln Cys Ala Val Lys Lys Val Arg
420 425 430

Leu Glu Val Phe Arg Ala Glu Glu Leu Met Ala Cys Ala Gly Leu Thr
435 440 445

Ser Pro Arg Ile Val Pro Leu Tyr Gly Ala Val Arg Glu Gly Pro Trp
450 455 460

Val Asn Ile Phe Met Glu Leu Leu Glu Gly Gly Ser Leu Gly Gln Leu
465 470 475 480

Val Lys Glu Gln Gly Cys Leu Pro Glu Asp Arg Ala Leu Tyr Tyr Leu
485 490 495

Gly Gln Ala Leu Glu Gly Leu Glu Tyr Leu His Ser Arg Arg Ile Leu
500 505 510

His Gly Asp Val Lys Ala Asp Asn Val Leu Leu Ser Ser Asp Gly Ser
515 520 525

His Ala Ala Leu Cys Asp Phe Gly His Ala Val Cys Leu Gln Pro Asp
530 535 540

Gly Leu Gly Lys Ser Leu Leu Thr Gly Asp Tyr Ile Pro Gly Thr Glu
545 550 555 560

Thr His Met Ala Pro Glu Val Val Leu Gly Arg Ser Cys Asp Ala Lys
565 570 575

Val Asp Val Trp Ser Ser Cys Cys Met Met Leu His Met Leu Asn Gly
580 585 590

Cys His Pro Trp Thr Gln Phe Phe Arg Gly Pro Leu Cys Leu Lys Ile
595 600 605

Ala Ser Glu Pro Pro Pro Val Arg Glu Ile Pro Pro Ser Cys Ala Pro
610 615 620

Leu Thr Ala Gln Ala Ile Gln Glu Gly Leu Arg Lys Glu Pro Ile His
625 630 635 640

Arg Val Ser Ala Ala Glu Leu Gly Gly Lys Val Asn Arg Ala Leu Gln
645 650 655

Gln Val Gly Gly Leu Lys Ser Pro Trp Arg Gly Glu Tyr Lys Glu Pro
660 665 670

Arg His Pro Pro Pro Asn Gln Ala Asn Tyr His Gln Thr Leu His Ala
675 680 685

Gln Pro Arg Glu Leu Ser Pro Arg Ala Pro Gly Pro Arg Pro Ala Glu
690 695 700

Glu Thr Thr Gly Arg Ala Pro Lys Leu Gln Pro Pro Leu Pro Pro Glu
705 710 715 720

Pro Pro Glu Pro Asn Lys Ser Pro Pro Leu Thr Leu Ser Lys Glu Glu
725 730 735

Ser Gly Met Trp Glu Pro Leu Pro Leu Ser Ser Leu Glu Pro Ala Pro
740 745 750

Ala Arg Asn Pro Ser Ser Pro Glu Arg Lys Ala Thr Val Pro Glu Gln
755 760 765

Glu Leu Gln Gln Leu Glu Ile Glu Leu Phe Leu Asn Ser Leu Ser Gln
770 775 780

Pro Phe Ser Leu Glu Glu Gln Glu Gln Ile Leu Ser Cys Leu Ser Ile
785 790 795 800

Asp Ser Leu Ser Leu Ser Asp Asp Ser Glu Lys Asn Pro Ser Lys Ala
805 810 815

Ser Gln Ser Ser Arg Asp Thr Leu Ser Ser Gly Val His Ser Trp Ser
820 825 830

Ser Gln Ala Glu Ala Arg Ser Ser Ser Trp Asn Met Val Leu Ala Arg
835 840 845

Gly Arg Pro Thr Asp Thr Pro Ser Tyr Phe Asn Gly Val Lys Val Gln
850 855 860

Ile Gln Ser Leu Asn Gly Glu His Leu His Ile Arg Glu Phe His Arg
865 870 875 880

Val Lys Val Gly Asp Ile Ala Thr Gly Ile Ser Ser Gln Ile Pro Ala
885 890 895

Ala Ala Phe Ser Leu Val Thr Lys Asp Gly Gln Pro Val Arg Tyr Asp
900 905 910

Met Glu Val Pro Asp Ser Gly Ile Asp Leu Gln Cys Thr Leu Ala Pro
915 920 925

Asp Gly Ser Phe Ala Trp Ser Trp Arg Val Lys His Gly Gln Leu Glu
930 935 940

Asn Arg Pro
945

<210> 3.
<211> 175
<212> PRT
<213> Homo sapiens

<400> 3

Met Pro Lys Arg Ser Cys Pro Phe Ala Asp Val Ala Pro Leu Gln Leu
1 5 10 15

6

Lys Val Arg Val Ser Gln Arg Glu Leu Ser Arg Gly Val Cys Ala Glu
20 25 30

Arg Tyr Ser Gln Glu Val Phe Glu Lys Thr Lys Arg Leu Leu Phe Leu
35 40 45

Gly Ala Gln Ala Tyr Leu Asp His Val Trp Asp Glu Gly Cys Ala Val
50 55 60

Val His Leu Pro Glu Ser Pro Lys Pro Gly Pro Thr Gly Ala Pro Arg
65 70 75 80

Ala Ala Arg Gly Gln Met Leu Ile Gly Pro Asp Gly Arg Leu Ile Arg
85 90 95

Ser Leu Gly Gln Ala Ser Glu Ala Asp Pro Ser Gly Val Ala Ser Ile
100 105 110

Ala Cys Ser Ser Cys Val Arg Ala Val Asp Gly Lys Ala Val Cys Gly
115 120 125

Gln Cys Glu Arg Ala Leu Cys Gly Gln Cys Val Arg Thr Cys Trp Gly
130 135 140

Cys Gly Ser Val Ala Cys Thr Leu Cys Gly Leu Val Asp Cys Ser Asp
145 150 155 160

Met Tyr Glu Lys Val Leu Cys Thr Ser Cys Ala Met Phe Glu Thr
165 170 175

<210> 4
<211> 110
<212> PRT
<213> Homo sapiens

<400> 4

Met Pro Lys Arg Ser Cys Pro Phe Ala Asp Val Ala Pro Leu Gln Leu
1 5 10 15

Lys Val Arg Val Ser Gln Arg Glu Leu Ser Arg Gly Val Cys Ala Glu
20 25 30

Arg Tyr Ser Gln Glu Val Phe Asp Pro Ser Gly Val Ala Ser Ile Ala
35 40 45

Cys Ser Ser Cys Val Arg Ala Val Asp Gly Lys Ala Val Cys Gly Gln
50 55 60

Cys Glu Arg Ala Leu Cys Gly Gln Cys Val Arg Thr Cys Trp Gly Cys
65 70 75 80

Gly Ser Val Ala Cys Thr Leu Cys Gly Leu Val Asp Cys Ser Asp Met
85 90 95

Tyr Glu Lys Val Leu Cys Thr Ser Cys Ala Met Phe Glu Thr
100 105 110

<210> 5
 <211> 10
 <212> PRT
 <213> Artificial sequence

<220>
 <223> Myc tag

<400> 5

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
 1 5 10

<210> 6
 <211> 528
 <212> DNA
 <213> Homo sapiens

<400> 6
 atgcccaagc ggagctgccc ctctcgcgac gtggccccgc tacagctcaa ggtccgcgtg 60
 agccagaggg agttgagccg cggcgtgtgc gccgagcgct actcgcagga ggtcttcgag 120
 aagaccaagc gactcctgtt cctcggggcc caggcctacc tggaccacgt gtgggatgaa 180
 ggctgtgccg tcgttcacct gccagagtcc ccaaagcctg gccctacagg ggccccgagg 240
 gctgcacgtg ggagatgct gattggacca gacggccgcc tgatcaggag ccttgggcag 300
 gcctccgaag ctgacctatc tggggtagcg tccattgcct gttcctcatg cgtgcgagcc 360
 gtggatggga aggcggctcg cggtcagtgt gagcgagccc tgtgcgggca gtgtgtgcgc 420
 acctgctggg gctgcggctc cgtggcctgt accctgtgtg gcctcgtgga ctgcagtgac 480
 atgtacgaga aagtgtgtg caccagctgt gccatgttcg agacctga 528

<210> 7
 <211> 333
 <212> DNA
 <213> Homo sapiens

<400> 7
 atgcccaagc ggagctgccc ctctcgcgac gtggccccgc tacagctcaa ggtccgcgtg 60
 agccagaggg agttgagccg cggcgtgtgc gccgagcgct actcgcagga ggtcttcgac 120
 ccatctgggg tagcgtccat tgcctgttcc tcatcgctgc gagccgtgga tgggaaggcg 180
 gtctgcggtc agtgtgagcg agccctgtgc gggcagtgtg tgcgcacctg ctggggctgc 240
 ggctccgtgg cctgtaccct gtgtggcctc gtggactgca gtgacatgta cgagaaagtg 300
 ctgtgcacca gctgtgccat gttcgagacc tga 333

<210> 8
 <211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Single strand DNA oligonucleotide

<400> 8
 ccaagctatt tcaatcgtgt gaaagtccaa atac 34

<210> 9
 <211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Single strand DNA oligonucleotide

 <400> 9
 gtatttgac tttcacacga ttgaaatagc ttgg 34

 <210> 10
 <211> 16
 <212> PRT
 <213> Artificial sequence

 <220>
 <223> A peptide corresponding to a sequence within the NIK kinase domain

 <400> 10
 Arg Leu Gly Arg Gly Ser Phe Gly Glu Val His Arg Met Glu Asp Lys
 1 5 10 15

 <210> 11
 <211> 42
 <212> DNA
 <213> Artificial sequence

 <220>
 <223> Single strand DNA oligonucleotide

 <400> 11
 gagggctctgg aatacctaca ttcccgcagg attctgcatg gg 42

 <210> 12
 <211> 42
 <212> DNA
 <213> Artificial sequence

 <220>
 <223> Single strand DNA oligonucleotide

 <400> 12
 cccatgcaga atcctgcggg aatgtaggta ttccagaccc tc 42

 <210> 13
 <211> 64
 <212> DNA
 <213> Artificial sequence

 <220>
 <223> Single strand DNA oligonucleotide

 <400> 13
 gatccccctac ctccactcac gaaggattca agagatcctt cgtgagtgga ggtatttttg 60
 gaaa 64

 <210> 14
 <211> 64
 <212> DNA
 <213> Artificial sequence

 <220>
 <223> Single strand DNA oligonucleotide

 <400> 14
 agcttttcca aaaatacctc cactcacgaa ggatctcttg aatccttcgt gaggagggt 60
 aggg 64

<210> 15
<211> 19
<212> DNA
<213> Artificial sequence

<220>
<223> NIK siRNA sequence corresponding with nucleotides 1513 1531

<400> 15
tacctccact cacgaagga

19